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Title	Cannabis use among middle and high school students in Ontario, Canada: a school-based cross-sectional study
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Reviewer 1	Gabriela Ilie
Institution	Division of Neurosurgery and Injury Prevention Research Office, St. Michael's Hospital, Toronto, Ont.
General comments (author response in bold)	This is a well balanced examination of the association between cannabis use and tobacco, alcohol use and ethnicity. The cross sectional examination of this sample is appropriate using stratification and weighting. The writing is clear and the information provided necessary to inform new legislation and services around the issue of cannabis legalization. We thank the reviewer for this positive feedback.
Reviewer 2	Michelle Rotermann
Institution	Health Information and Research Division, Statistics Canada, Ottawa
General comments (author response in bold)	<p>1. Disagree with the statement: pg 3 Ln10 –“little is known on the patterns and factors associated with cannabis use among adolescents on the eve of legalization”.... There have been 9 national surveys going back to 1985 that have sampled the hhd population aged 15+ about their cannabis use and if you add to the Canadian data from the NLSY, CSTADS, YSS for Canada with ESPAD (European Student) data and the various American student surveys this statement is weak, at best. Suggest removal/replacement. We agree with the reviewer that there have been several studies on cannabis use since 1985; however, those studies had addressed different research questions. Nevertheless, the statement has been revised.</p> <p>2. Suggest wording change: pg 4 Ln 3“given the impending...it seems prudent to expect cannabis use could increase” In my opinion the question about whether cannabis use will increase with legalization should be related to other jurisdictions who introduced legalization and present whether data showed increases in things like self-reported use, but also visits to EDs, etc. Also, the authors could explore the literature to see if there is any evidence that legalization of cannabis for medicinal purposes in Canada in 2001 resulted in self-reported use increases or whether youth’s perception of risk from using marijuana or cannabis has fallen post 2001. We have deleted that statement from the introduction. The focus of the present study was on Canadian data. Literature about consequences of legalization of cannabis is equivocal and beyond the scope of the present study.</p> <p>3. Modify/strengthen for rationale for doing study: perhaps excerpts from OSDUHS documentation can help. E.g. Cannabis/marijuana use by young people is constantly changing as is their use of cigarettes and alcohol. As new drugs, newer methods e.g. vaping, changing supply or changes in the perception of the risk associated with marijuana/cannabis also change, it remains important to assess levels of use, related harms and perceptions. Monitoring drug use provides valuable information about determinants (established and emerging) and co-use of cannabis with alcohol, tobacco and/or other drugs. These data enable the evaluation of the effectiveness of policies, education programs, etc. History has demonstrated that the values and lifestyles of adolescents/youth also change quickly and close monitoring can help to ensure that programmatic responses are based not on sensationalized fears but rather empirical evidence. We thank the reviewer for this suggestion. The introduction has been revised accordingly (see p.3 and 4).</p> <p>4. Table 1 –Unclear from table if percentages presented are weighted to represent all Ontario students in grades 7 to 12. Please clarify. Inclusion of N column adds to the confusion. Also, confusing is that page 2 indicates that the total sample= 9920 but because rows included are not mutually exclusive it makes interpreting the cannabis use, synthetic cannabis use and grade at cannabis initiation estimates difficult to interpret. Please clarify. Table 1 has been revised.</p> <p>5. Recommend adding data source to all tables. Data source has been added to all tables.</p> <p>6. Table 2 –statistical significance is noted but it is unclear which values are the reference categories. Reference categories have been added to the table.</p> <p>7. Note on Table 2 indicates chi square adjusted for survey design. Is this the design effect? Pg 295 from Reference 1? Did you use the average DEFF of 4.06? Please clarify. This is a chi-square test adjusted for the COMPLEX survey design and transformed into an F-statistic. We have added “complex” for clarity (see footnote on Table 2). We used Tylor series linearization methods to account for the complex sample design for all analyses (see p.7).</p> <p>8. Pg 9; Ln 52 –authors conclude that cannabis use lower in Canada. Please confirm as 21.5% (95% Cis 19.3%- 23.8%) current use estimate vs US estimate of 21.7% (95% Cis 19.3%-24.2% has overlapping Cis and therefore comparable. With respect to lifetime estimates am wondering if differences between Ontario estimates is really lower if the grades 8 were not included? This should be mentioned. The statement has been revised.</p> <p>9. Pg 9 – Also, other surveys which have collected data from across the country indicate that use varies substantially across provinces for lifetime and past-year use. Therefore comparisons with a single point estimate for the US might not be appropriate/ comparable. Again, this should be mentioned. Perhaps these Ontario estimates could be compared to estimates from other provinces. We thank the reviewer for this comment. The statement has been revised.</p> <p>10. Pg 9; Ln 56: unclear how heavy use defined. Also, in my opinion discussion/interpretation section should be reserved for findings presented in Results section. Couldn’t find heavy use findings presented in manuscript previously. Suggest deleting. As suggested, heavy use has been deleted.</p> <p>11. Pg 9; Ln 5 –section about year to year increases. Suggest deleting or moving as article is about cross-sectional use. As suggested, this section has been deleted.</p> <p>12. Pg. 11, Ln 7/8. Authors could test their assertion about the estimates being under-estimates because they exclude drop-outs by comparing these estimates to other estimates from household surveys which don’t require being a student. This information has been added to the discussion.</p>

Omissions

Pg 4 –The authors indicate that student response rate was 59% and the class rate was 88% (pg 11) but there is no mention of the school willingness to participate. In my opinion not reporting information about school participation is insufficient and an important piece of information to help evaluate the study's findings/generalizability. Also, if school willingness was low/school recruitment difficult this is an important point that should be discussed in the paper. Finally, there is a literature that has found that non-participation of schools does not largely affect the validity of resulting prevalence estimates. See Thrul J, Pabst A, Kraus L The impact of school non-response on substance use prevalence estimates-Germany as a case study. ESPAD (European School Study project on alcohol and other drugs) reports provide details about the reasons why schools/classes refuse to participate. They also note that 89% of sampled classes/schools participate. Would be interesting to know how OSDUHS compares. This might/could be an interesting addition to this paper.

This information has been added to the text (see p.5).

Pg 7; Ln 7/8- authors indicate that 4.9% (about 500) of students were dropped from analysis because of missing data. In my opinion any time 3% or more of records is removed an analysis should be done to determine if dropped records differed appreciably from those retained. In this case, indicating whether they were more likely to be males or females, in younger or older grades and/or from schools in more urban rather rural locales would be sufficient.

What isn't clear from pg 7 is whether the data were weighted. A simple sentence indicating whether survey weights were used or not would suffice.

Individuals with missing data were more likely to be males and in younger grades. However, with-and-without analyses showed that excluded missing data from the analyses did not have significant impact on the results. Sampling weights were used to account for the complex sampling design of the survey. This information has been added to the text.